IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in

the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1.   (Currently Amended) An information transmitting apparatus which

transmits a plurality of signals, said signals including at least video signals and audio signals, to

an information receiving apparatus, said information transmitting apparatus comprising:

a plurality of encoding means for separately encoding each of said video signals

and each of said audio signals;

first multiplexing means for multiplexing a plurality of pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal;

second multiplexing means for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals; and

control means for controlling a multiplexing ratio among the plurality of signals

in the second multiplexing means, controlling a video data occupation bandwidth, an audio data

occupation bandwidth, and a program data occupation bandwidth in relation to a transmission

channel bandwidth,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

2.   (Original) The information transmitting apparatus according to claim 1, wherein the transmitting apparatus transmits the plurality of signals as a single transport stream.

3.   (Original) The information transmitting apparatus according to claim 1, further comprising database means for providing data that relates to transmission rates of the plurality of signals at each time point, wherein the control means controls the multiplexing ratio while referring to the database means.

4.   (Previously Presented) The information transmitting apparatus according to claim 1, wherein the control means controls an output rate of each of the plurality of encoding means.

5.   (Previously Presented) The information transmitting apparatus according to claim 1, wherein the plurality of signals further comprise program information.

6.   (Currently Amended) An information transmitting apparatus which transmits program information to an information receiving apparatus, said information transmitting apparatus comprising:

         a plurality of video encoding means for encoding each video signal;

         a plurality of audio encoding means for encoding each audio signal;

         program information data generating means for generating data of the program information;

first multiplexing means for multiplexing the data of the program information that is output from the program information data generating means with encoded video data that is output from the plurality of video encoding means and encoded audio data that is output from the plurality of audio encoding means in order to form pairs of multiplexed data;

second multiplexing means for multiplexing the pairs of multiplexed encoded video data, encoded audio data and data of the program information; and

control means for controlling a data output rate of each of the plurality of video encoding means, a data output rate of each of the plurality of audio encoding means, a data output rate of the program information data generating means, and a multiplexing ratio among the encoded video data, the encoded audio data, the data of the program information in the second multiplexing means, a video data occupation bandwidth, an audio data occupation bandwidth, and a program data occupation bandwidth in relation to a transmission channel bandwidth,

wherein the information receiving apparatus reads contents of a program information data of a current program and a next program at a re-transmission cycle of the program information data of the current program and the next program, and recognizes a transmission status of the program information data indicating broadcast schedules.

7.   (Currently Amended) An information transmitting method for transmitting a plurality of signals, said signals including at least video signals and audio signals, to an information receiving apparatus, said information transmitting method comprising:

an encoding step for separately encoding each of said video signals and each of said audio signals;

a first multiplexing step for multiplexing a plurality of pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal;

a second multiplexing step for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals; and

a control step for controlling a multiplexing ratio among the plurality of signals in

the second multiplexing step, a video data occupation bandwidth, an audio data occupation

bandwidth, and a program data occupation bandwidth in relation to a transmission channel

bandwidth,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

8.   (Original) The information transmitting method according to claim 7,

wherein the control step controls the multiplexing ratio while referring to data that relates to

transmission rates of the plurality of signals at each time point.

9.   (Previously Presented) The information transmitting method according to

claim 7, wherein the plurality of signals are further comprise program information.

10.   (Currently Amended) An information transmitting method for

transmitting program information to an information receiving apparatus, said information

transmitting method comprising:

a video encoding step of encoding each video signal of each of a plurality of

video encoding means;

an audio encoding step of encoding each audio signal of each of a plurality of

audio encoding means;

a program information data generating step of generating data of the program

information;

a first multiplexing step of multiplexing the data of the program information that

is output by the program information data generating step with encoded video data that is output

by the video encoding step and encoded audio data that is output by the audio encoding step in

order to form pairs of multiplexed data;

a second multiplexing step for multiplexing the pairs of multiplexed encoded

video data, encoded audio data and multiplexed data of the program information;

a control step of controlling a data output rate of each of the plurality of video

encoding means in the video encoding step, a data output rate of each of the plurality of audio

encoding means in the audio encoding step, a data output rate of the program information data

generating step, a multiplexing ratio among the encoded video data, the encoded audio data, and

the data of the program information in the second multiplexing step, a video data occupation

bandwidth, an audio data occupation bandwidth, and a program data occupation bandwidth in

relation to a transmission channel bandwidth; and

an acquiring step of acquiring electronic program guide data, at the information

receiving apparatus, only during a data transfer rate increase period,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

        11.   (Currently Amended) A provider for providing a computer-readable

program for causing an information transmitting apparatus which transmits a plurality of signals,

said signals including at least video signals and audio signals, to an information receiving

apparatus to execute a process comprising:

        an encoding step for separately encoding each of said video signals and each of

said audio signals;

        a first multiplexing step for multiplexing a plurality of pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal;

        a second multiplexing step for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals;

        a control step for controlling a multiplexing ratio among the plurality of signals in

the second multiplexing step, a video data occupation bandwidth, an audio data occupation

bandwidth, and a program data occupation bandwidth in relation to a transmission channel

bandwidth; and

        an acquiring step for acquiring electronic program guide data, at the information

receiving apparatus, only during a data transfer rate increase period,

        wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

12.   (Original) The provider according to claim 11, wherein the control step controls the multiplexing ratio while referring to data that relates to transmission rates of the plurality of signals at each time point.

13.   (Previously Presented) The provider according to claim 11, wherein the plurality of signals are further comprise program information.

14.   (Currently Amended) A provider for providing a computer-readable program for causing an information transmitting apparatus which transmits program information to an information receiving apparatus, to execute a process comprising:

a video encoding step of encoding each video signal of each of a plurality of video encoding means;

an audio encoding step of encoding each audio signal of each of a plurality of audio_encoding means;

a program information data generating step of generating data of the program information;

a first multiplexing step of multiplexing the data of the program information that is output by the program information data generating step with encoded video data that is output by the video encoding step and encoded audio data that is output by the audio encoding step in order to form pairs of multiplexed data;

a second multiplexing step for multiplexing the pairs of multiplexed encoded video data, encoded audio data and data of the program information;

a control step of controlling a data output rate of each of the plurality of video

encoding means in the video encoding step, a data output rate of each of the plurality of audio

encoding means in the audio encoding step, a data output rate of the program information data

generating step, and a multiplexing ratio among the encoded video data, the encoded audio data,

the data of the program information in the second multiplexing step, a video data occupation

bandwidth, an audio data occupation bandwidth, and a program data occupation bandwidth in

relation to a transmission channel bandwidth; and

an acquiring step of acquiring electronic program guide data, at the information

receiving apparatus, only during a data transfer rate increase period,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

15.   (Currently Amended) An information receiving apparatus which receives

multiplexed program information that is comprised of a plurality of multiplexed pairs of encoded

signals, each pair of encoded signals having one encoded video signal and one encoded audio

signal, said information receiving apparatus comprising:

acquiring electronic program guide data only during a data transfer rate increase

period;

separating means for separating the multiplexed program information;

a plurality of decoding means for separately decoding each of the video signals

and each of the audio signals;

storing means for storing the program information separated by the separating

means; and

control means for controlling a data acquisition time and for controlling

operations of the separating means and the storing means in accordance with a transmission rate

of the program information and the data acquisition time,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

16.   (Canceled)

17.   (Currently Amended) An information receiving method for receiving

program information that is comprised of a plurality of multiplexed pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal, said

information receiving method comprising:

an acquiring step for acquiring electronic program guide data only during a data

transfer rate increase period;

a separating step for separating the multiplexed program information;

a decoding step for separately decoding each of the video signals and each of the

audio signals;

a storing step for storing the program information separated by the separating

step; and

a control step for controlling a data acquisition time and for controlling operations

of the separating step and the storing step in accordance with a transmission rate of the program

information and the data acquisition time,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

18.   (Canceled)

19.   (Currently Amended) A provider for providing a computer-readable

program for causing an information receiving apparatus which receives program information that

is comprised of a plurality of multiplexed pairs of encoded signals, each pair of encoded signals

having one encoded video signal and one encoded audio signal, to execute a process comprising:

acquiring electronic program guide data only during a data transfer rate increase

period;

a separating step for separating the multiplexed program information;

a decoding step for separately decoding each of the video signals and each of the

audio signals;

a storing step for storing the program information separated by the separating

step; and

a control step for controlling a data acquisition time and for controlling operations

of the separating step and the storing step in accordance with a transmission rate of the program

information and the data acquisition time,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

20.   (Canceled)

21.   (Currently Amended) A broadcasting system having an information

transmitting apparatus which transmits program information to an information receiving

apparatus which receives multiplexed program information comprised of a plurality of

multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video

signal and one encoded audio signal,

the information transmitting apparatus comprising:

a plurality of video encoding means for encoding each video signal;

a plurality of audio encoding means for encoding each audio signal;

program information data generating means for generating data of the program

information;

first multiplexing means for multiplexing the data of the program information that

is output from the program information data generating means with encoded video data that is

output from the plurality of video encoding means and encoded audio data that is output from the

plurality of audio encoding means in order to form pairs of multiplexed data;

second multiplexing means for multiplexing the pairs of multiplexed encoded

video data, encoded audio data and data of the program information; and

        control means for controlling a data output rate of each of the plurality of video

encoding means, a data output rate of each of the plurality of audio encoding means, a data

output rate of the program information data generating means, and a multiplexing ratio among

the encoded video data, encoded the audio data, the data of the program information in the

second multiplexing means a video data occupation bandwidth, an audio data occupation

bandwidth, and a program data occupation bandwidth in relation to a transmission channel

bandwidth, and

        the information receiving apparatus comprising:

        acquiring means for acquiring electronic program guide data only during a data

transfer rate increase period;

        separating means for separating the multiplexed program information;

        a plurality of decoding means for separately decoding each of the video signals

and each of the audio signals;

        storing means for storing the program information separated by the separating

means; and

        control means for controlling operations of the separating means and the storing

means in accordance with a transmission rate of the program information,

        <u>wherein the information receiving apparatus reads contents of a program</u>

<u>information data of a current program and a next program at a re-transmission cycle of the</u>

<u>program information data of the current program and the next program, and recognizes a</u>

<u>transmission status of the program information data indicating broadcast schedules.</u>

22.   (Currently Amended) An information transmitting apparatus which

transmits program information to an information receiving apparatus, said information

transmitting apparatus comprising:

program information data generating means for generating program information

data including information of a transmission status of the program information;

first multiplexing means for multiplexing the program information data generated

by the program information data generating means with a plurality of pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal; and

second multiplexing means for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals;

control means for controlling a video data occupation bandwidth, an audio data

occupation bandwidth, and a program data occupation bandwidth in relation to a transmission

channel bandwidth,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

23.   (Currently Amended) An information transmitting method for

transmitting program information to an information receiving apparatus, said information

transmitting method comprising:

a program information data generating step for generating program information

data including information of a transmission status of the program information;

a first multiplexing step for multiplexing the program information data generated

by the program information data generating means with a plurality of pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal; and

a second multiplexing step for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals;

a control step of controlling a video data occupation bandwidth, an audio data

occupation bandwidth, and a program data occupation bandwidth in relation to a transmission

channel bandwidth,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

24.   (Currently Amended) A provider for providing a computer-readable

program for causing an information transmitting apparatus which transmits program information

to an information receiving apparatus, to execute a process comprising:

a program information data generating step for generating program information

data including information of a transmission status of the program information;

a first multiplexing step for multiplexing the program information data generated

in the program information data generating means with a plurality of pairs of encoded signals,

each pair of encoded signals having one encoded video signal and one encoded audio signal; and

a second multiplexing step for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals;

a control step for controlling a video data occupation bandwidth, an audio data

occupation bandwidth, and a program data occupation bandwidth in relation to a transmission

channel bandwidth,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

25.   (Currently Amended) An information receiving apparatus which receives

multiplexed program information that is comprised of a plurality of multiplexed pairs of encoded

signals, each pair of encoded signals having one encoded video signal and one encoded audio

signal, said information receiving apparatus comprising:

acquiring means for acquiring electronic program guide data only during a data

transfer rate increase period;

separating means for separating the multiplexed program information;

a plurality of decoding means for separately decoding each of the video signals

and each of the audio signals;

extracting means for extracting information of a transmission status of the

program information that is included in the program information data separated by the separating

means; and

control means for controlling a data acquisition time and for controlling

operations of the separating step in accordance with a transmission rate of the program

information and the data acquisition time,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

        26.   (Currently Amended) An information receiving method for receiving

multiplexed program information comprised of a plurality of multiplexed pairs of encoded

signals, each pair of encoded signals having one encoded video signal and one encoded audio

signal, said information receiving method comprising:

        an acquiring step for acquiring electronic program guide data only during a data

transfer rate increase period;

        a separating step for separating the multiplexed program information;

        a decoding step for separately decoding each of the video signals and each of the

audio signals; and

        an extracting step for extracting information of a transmission status of the

program information that is included in the program information data separated by the separating

step; and

        control means for controlling a data acquisition time and for controlling

operations of the separating step in accordance with a transmission rate of the program

information and the data acquisition time,

        wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

27.   (Currently Amended) A provider for providing a computer-readable

program for causing an information receiving apparatus which receives multiplexed program

information comprised of a plurality of multiplexed pairs of encoded signals, each pair of

encoded signals having one encoded video signal and one encoded audio signal, to execute a

process comprising:

an acquiring step for acquiring electronic program guide data only during a data

transfer rate increase period;

a separating step for separating the multiplexed program information;

a decoding step for separately decoding each of the video signals and each of the

audio signals; and

an extracting step for extracting information of a transmission status of the

program information that is included in the program information data separated by the separating

step; and

control means for controlling a data acquisition time and for controlling

operations of the separating step in accordance with a transmission rate of the program

information and the data acquisition time,

wherein the information receiving apparatus reads contents of a program

information data of a current program and a next program at a re-transmission cycle of the

program information data of the current program and the next program, and recognizes a

transmission status of the program information data indicating broadcast schedules.

28.   (Currently Amended) A broadcasting system having an information

transmitting apparatus which transmits program information to an information receiving

apparatus which receives multiplexed program information comprised of a plurality of

multiplexed pairs of encoded signals, each pair of encoded signals having one encoded video

signal and one encoded audio signal,

the information transmitting apparatus comprising:

program information data generating means for generating program information

data including information of a transmission status of the program information;

first multiplexing means for multiplexing the program information data generated

by the program information data generating means with a plurality of pairs of encoded video

signals and encoded audio signals;

second multiplexing means for multiplexing the multiplexed plurality of pairs of

encoded video signals and encoded audio signals; and

control means for controlling a video data occupation bandwidth, an audio data

occupation bandwidth, and a program data occupation bandwidth in relation to a transmission

channel bandwidth; and

the information receiving apparatus comprising:

acquiring means for acquiring electronic program guide data only during a data

transfer rate increase period;

separating means for separating the multiplexed program information; and

extracting means for extracting information of a transmission status of the

program information that is included in the program information data separated by the separating

means,

<u>wherein the information receiving apparatus reads contents of a program</u>

<u>information data of a current program and a next program at a re-transmission cycle of the</u>

<u>program information data of the current program and the next program, and recognizes a</u>

<u>transmission status of the program information data indicating broadcast schedules</u>.